

Sludge Spreading in Critical Watersheds in North Carolina

It is clear that a multitude of various chemicals are likely entering our water supplies, food chain and ecosystems via effluent and sewage sludge from wastewater treatment plants. Research shows that certain chemicals found in sludge destroy the reproductive systems of fish and other animals. The long-term impacts from these uncontrolled and unregulated substances on humans are unknown.

Until a safe alternative for disposal of sewage sludge is found, the land application of sewage sludge near surface waters should be minimized through the use of increased buffers, and sludge spreading in critical watersheds should not be allowed regardless of when the field was permitted. Further, the 1992 Water Supply Watershed Protection Act prohibits the permitting of new residuals application sites in critical areas 1/2 mile from the intakes of WS-II, WS-III, and WS-IV watersheds. This restriction should also apply to existing sludge fields located in these sensitive areas that supply water to downstream communities.

Sludge spreading in critical watersheds after 1992.

The NC DENR Division of Water Quality (DWQ) erroneously permitted a total of 8 fields to municipalities located in 5 counties in NC after the Watershed Water Supply Protection Act was created in 1992. Permit holders included the City of Burlington, the City of Mebane, the City of Gastonia, the City of Newton, and the Town of Granite Falls. Research being completed by the League alerted DWQ to the illegally permitted fields.

On November 25, 2009, the Division of Water Quality (DWQ) sent letters to five public utilities concerning the eight sludge fields that had been permitted in critical watersheds in 5 counties: Orange, Caldwell, Gaston, Catawba, and Alamance. The letter “encourages” the permittee to consider removing the field from the permit. The DWQ states that removal of the fields from permits will take place during the next permitting action which normally is at the end of the five years when the permit expires. The letter asks each permittee for a written response acknowledging receipt of the letter, and an “action plan” for removal of the field(s) from use.¹ Instead of removing the fields from permits, DWQ has allowed these fields to remain under the permits, in violation of the 1992 Watershed Water Supply Protection Act.

Permits for sludge fields are good for a total of five years. However, Senate Bill 2009-406, entitled, “An Act To Extend Certain Government Approvals Affecting The Development of Real Property Within The State,” extends coverage of certain permits under 15 DWQ programs. Although the bill did not purposely target permits for land application of sewage sludge, the five-year permits for sludge spreading were also extended to a total of eight years.

¹ Letter sent to municipalities from Jon Risgaard, Aquifer Protection Section, Nov. 25, 2009.

The bill *includes* permits under the Residuals Management Program between Jan. 1, 2008 and Dec. 31, 2010 (article 21 of Chapter 143 of General Statutes). Below are the new dates of expiration for each permitted field:

Permittee	DWQ Permit Number	Permit Expiration Date
City of Burlington	WQ0000520	7/31/2016
Town of Granite Falls	WQ0001618	3/14/2014
City of Gastonia	WQ0001793	6/30/2014
City of Newton	WQ0003902	5/31/2014
Town of Mebane	WQ0004033	5/31/2013

Table courtesy of NC Division of Water Quality

If a field is still listed on a permit to accept sludge then the permittee may continue to apply sludge under that permit until the field is removed from the permit. Thus, under the current system these fields will technically be available to receive sludge for another 3-6 years. According to DWQ, the City of Newton is the only permittee that has removed a sludge field from its permit. We are requesting that DWQ immediately remove the remaining sludge fields from all permits issued to municipalities after 1992 without delay and before the expiration date.

Sludge spreading in critical watersheds before 1992.

Research conducted by the League shows that sludge is being actively spread on 11 fields located in critical watersheds permitted prior to 1992. The 1992 Watershed Water Supply Protection Act prohibits the permitting of new sludge fields in critical areas 1/2 mile from intake of WS-II, WS-III, and WS-IV watersheds. According to Julie Ventaloro, Coordinator, Water Supply Watershed Protection Program NC Division of Water Quality, this restriction does not apply to existing application sites.

Mallinckrodt, Inc., located in Wake County, is applying sludge on 9 fields adjacent to the Neuse River. The fields range in size from less than an acre to 25-acres. A water intake on the Neuse River is located approximately 700 ft. from the closest sludge field. Currently, the water intake is not being used, but is being considered for re-use by Franklin County.²

An Associated Press investigation found that prescription drugs have been found in the drinking water of over 41 million Americans. Mallinckrodt, Inc., sends its pretreated liquid waste to the Raleigh wastewater treatment plant; however, it spreads sludge on 29 permitted acres onsite from its manufacturing processes via a wastewater treatment plant. According to its website Mallinckrodt, Inc., is “a world leader in supplying bulk narcotics and offers the most diverse line of products.”³ Their products include opiates such as codeine phosphate, morphine sulfate, hydrocodone and oxycodone; synthetic-based products including propoxyphene (a widely used narcotic analgesic);

² Communication with Ed Hardee, DWQ, 6/16/10.

³ Mallinckrodt website, <http://www.mallinckrodt.com/>

meperidine (a strong synthetic narcotic used in the relief of moderate to severe pain); methadone (for heroine opiate addiction); naltrexone (for alcohol addiction); and methylphenidate (to treat attention deficit hyperactivity disorder).

The Mallinckrodt plant in Raleigh is the world's largest facility that manufactures acetaminophen, the active ingredient in Tylenol. Acetaminophen may be transformed into toxic compounds during chlorination in wastewater treatment plants, according to a recent research study. Under conditions simulating wastewater disinfection, acetaminophen reacted with hypochlorite to form a variety of products, two of which were identified as toxic compounds—1,4-benzoquinone and *N*-acetyl-*p*benzoquinoneimine (NAPQI) by authors Mary Bedner and William MacCrehan of the U.S. National Institute of Standards and Technology.

The study stresses the importance of studying the reaction products of pharmaceuticals more closely, because they can be more toxic or more stable than the parent compounds. Bedner said, "Acetaminophen is so common these days, since it is added to all sorts of sinus and cold medicines," Bedner said, "but it also has this dark side to its oxidation chemistry that we don't usually acknowledge."⁴

Huffman Finishing Co. in Caldwell County has 2 sludge fields permitted in a critical watershed area. Many of the dyes used to tint hosiery contain toxic substances such as ammonium sulfate, which has been identified as a toxic substance, an irritant to humans and causes toxic effects to fish and other aquatic organisms.⁵ Both Mallinckrodt, Inc. and Huffman Finishing Co. were permitted prior to the 1992 Watershed Water Supply Protection Act. There has been no legislation proposed or amendments that would require the removal of all sludge fields permitted prior to the 1992 Act.

Permitting sludge sites.

New applicants applying for a permit to spread sludge are now required to submit a map with their application to DWQ to verify that the field is not located within a critical watershed based on latitude and longitude data. Using lat/long data continues to be troublesome as it shows a point, and not the entire field. Also, permittees with existing permits are not required to submit a map to the state verifying that their acreage is not located in a critical watershed. *Note: the 8 permitted fields found located in critical watersheds were issued prior to the DWQ's new rule requiring new permittees to submit a map with the application.*

Requiring the permittee to submit a digital file (such as a kml file) would be a superior method of providing information to the state in verifying the exact location of a proposed sludge field. Also, all permittees should be required to submit to the state a digital file to verify that their fields are not located within a critical watershed. This would also result in a cost-saving measure for the state which spends extra time and money to send a staff

⁴ *Acetaminophen forms toxics during chlorination*, Environmental Science & Technology, Jn. 15, 2006. <http://pubs.acs.org/doi/pdf/10.1021/es062614v>

⁵ *Long-term effect of ammonium sulfate fertilizer on histophysiology of adrenal in the teleost, Channa punctatus (Bloch)*, Bulletin of Environmental Contamination and Toxicology, Ram and Singh, Vol. 41, 4-6, Oct. 1988.

person into the field to confirm the location of a field to receive sludge each time a new application for a permit is received.

Recommendations for DWQ and the State of NC

Enactment of moratorium by the Director of NC Division of Water Quality regarding the spreading of sewage sludge on fields located in critical watersheds permitted prior to 1992 on the grounds that spreading sludge in critical watersheds poses an imminent hazard to public health and the environment.

Immediate removal of all sludge fields from permits issued after 1992 to satisfy the legal and protective requirements of the 1992 Water Supply Watershed Protection Act.

NEW PERMITS. Requirement that permittees submit a digital file to DWQ with the permit application showing the locations of newly proposed sludge fields.

EXISTING PERMITS. Requirement that permittees submit a digital file to DWQ showing the locations of existing sludge fields.

A comprehensive review by DWQ using digital information to identify locations of existing sludge fields permitted in NC to ensure they are not located in a critical watershed.

Increase in the distance of 100 ft. to 1,000 ft. from sludge fields to private and public drinking supply sources, and surface waters which include streams - intermittent and perennial, perennial waterbodies, wetlands, ephemeral streams, waterways and ditches.